

REMARKS

I. STATUS OF THE CLAIMS

Claim 4 is canceled herein.

New claims 12-17 are added.

In view of the above, it is respectfully submitted that claims 1-3 and 5-17 are currently pending.

II. REJECTION OF CLAIMS 1-3, 6-8 AND 10-11 UNDER 35 USC 102(B) AS BEING ANTICIPATED BY SULHOFF

Claim 1 recites an optical amplifier comprising (a) a first-stage optical amplifying unit and a second-stage optical amplifying unit arranged in series with respect to an optical signal, where a first pumping light is supplied to said first-stage optical amplifying unit at an output side of said first-stage optical amplifying unit as backward pumping light, and a second pumping light is supplied to said second-stage optical amplifying unit at an input side of said second-stage optical amplifying unit as forward pumping light, (b) a common automatic gain control circuit performing automatic gain control in accordance with the optical signal at an input side of the first-stage optical amplifying unit and the optical signal at an output side of said second-stage optical amplifying unit, and (c) a pumping light distribution function unit receiving a control signal from said common AGC circuit and, in accordance with the received control signal, supplying said first and second pumping lights with a predetermined distribution ratio.

Please note that claim 1 is amended to recite that the first pumping light is supplied to said first-stage optical amplifying unit at an output side of said first-stage optical amplifying unit as *backward* pumping light.

Sulhoff discloses coils 76 and 78 that are provided with pumping light. However, in Sulhoff, coil 76 is provided with forward pumping light. This operation in Sulhoff is significantly different than that recited in the amended claim 1, where the first pumping light is supplied to said first-stage optical amplifying unit as *backward* pumping light.

In fact, in the rejection of claim 4, the Examiner notes that Sulhoff does not disclose a pumping light distribution function unit which performs backward pumping on a first-stage optical amplifying unit. Therefore, in the rejection of claim 4, the Examiner combines Sulhoff with Drake.

FIG. 1 of Drake discloses pumping light sources P1, P2 and P3. FIG. 2 of Drake shows the operation of pumping light sources P1, P2 and P3. As can be seen from FIG. 2 of Drake, generally, only pumping light source is operated at a time, except for small overlap periods between points A and B, and between points C and D in FIG. 2. These overlap periods in Drake are provided to take into account threshold changes of the laser diode pumping sources over time. See, for example, column 4, line 65, through column 5, line 20, of Drake. See especially column 5, lines 4-6, of Drake.

In comparison, in Sulhoff, the pumping light is distributed so that 95% is provided to the first coil 76 and 5% is provided to the second coil 78. This distribution of pumping light in Sulhoff is intended to ensure that coil 78 is pumped even when pump 70 is turned OFF. See, for example, column 13, line 57, through column 14, line 13, of Sulhoff.

Therefore, the pumping arrangement in Drake is provided for a significantly different reason than the pumping arrangement in Sulhoff. It is respectfully submitted that there is no suggestion in either reference to combine the references in the manner suggested by the Examiner. Accordingly, it is respectfully submitted that Drake should not be combined with Drake to reject claim 1.

The above comments are specifically directed to claim 1. However, it is respectfully submitted that the comments would be helpful in understanding various differences of various other claims over the cited references.

Claim 5 recites that the predetermined distribution ratio causes an increased gain near an upper limit where oscillation occurs in the first-stage optical amplifying unit so as to obtain a low noise figure. Claim 6 recites that the predetermined distribution ratio causes fluctuation of output at the output side of the second-stage optical amplifying unit due to ASE to be suppressed when a number of input wavelengths of the optical signal at the input side of the first-stage optical amplifying unit rapidly decreases. See, for example, paragraph [0060] of the application.

The invention of Sulhoff is directed to a significantly different purpose. More specifically, in Sulhoff, the pumping light is distributed so that 95% is provided to the first coil 76 and 5% is provided to the second coil 78. *This distribution of pumping light in Sulhoff is intended to ensure that coil 78 is pumped even when pump 70 is turned OFF.* See, for example, column 13, line 57, through column 14, line 13, of Sulhoff. Therefore, it is respectfully submitted that it would not be obvious to modify Sulhoff to achieve the present invention as recited, for example, in claim 1, and as specifically recited, for example, in claims 5 and 6.

Further, as indicated above, the distribution of pumping light in Drake is intended to take into account threshold changes of the laser diode pumping sources over time. It is respectfully submitted that no portion of Drake discloses or suggests any manner of modifying Sulhoff so that a predetermined distribution ratio causes an increased gain near an upper limit where oscillation occurs in the first-stage optical amplifying unit so as to obtain a low noise figure, as recited, for example, in claim 5, or so that the predetermined distribution ratio causes fluctuation of output at the output side of the second-stage optical amplifying unit due to ASE to be suppressed when a number of input wavelengths of the optical signal at the input side of the first-stage optical amplifying unit rapidly decreases, as recited, for example, in claim 6.

Therefore, it is respectfully submitted that Sulhoff should not be combined with Drake in the manner suggested by the Examiner.

In view of the above, it is respectfully submitted that the rejection is overcome.

III. REJECTION OF CLAIMS 4 AND 5 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER SULHOFF IN VIEW OF DRAKE

The comments in Section II, above, for distinguishing over Sulhoff and Drake, also apply here, where appropriate.

In view of the above, it is respectfully submitted that the rejection is overcome.

IV. REJECTION OF CLAIM 9 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER SULHOFF IN VIEW OF OHSHIMA

The comments in Section II, above, for distinguishing over Sulhoff, also apply here, where appropriate.

In view of the above, it is respectfully submitted that the rejection is overcome.

V. CONCLUSION

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

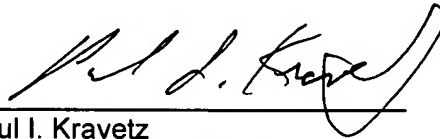
Serial No. 10/804,187

If any further fees are required in connection with the filing of this response, please charge such fees to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: May 1, 2006

By: 
Paul I. Kravetz
Registration No. 35,230

1201 New York Avenue, NW, 7th Floor
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501